that he will be well taught who follows this bulky manual faithfully through. The work has been thoroughly revised, largely rewritten, and very much increased in size, by Professor Rolleston's collaborator and successor, Mr. W. H. Jackson. For the benefit of those who are not familiar with the former edition (and there are comparatively few students in recent years in America who are familiar with it), a few words relative to the scope of the volume may be given. The first part of the volume is essentially a laboratory guide, illustrated by plates, of the anatomy of various selected types of animal structure; the second and larger part contains systematic morphological descriptions of the classes and higher divisions of the animal kingdom, with briefer discussions of the different orders, both fossil and recent. The descriptions are very comprehensive, essentially comparative, and modern. Not the least valuable part of the work are the bibliographies appended, in both parts, to type or class, and so arranged as to open up to the student special lines of study in any direction he may select.

The work is alike valuable to the special student and teacher of comparative anatomy, and will be scarcely less useful to the paleontologist and college teacher of zoölogy, as well as forming an excellent adjunct and continuation to Huxley and Martin. To the undergraduate, or even non-specialist post-graduate, almost its only service will be that of a work of reference. As Professor Rolleston says, the distinctive character of the book "consists in its attempting to so combine the concrete facts of zoötomy with the outlines of systematic classification as to enable the student to put them for himself into the natural relations of foundation and superstructure." But no student can appreciate or grasp the broad morphological principles underlying classification until he has first familiarized himself with the details upon which those principles are based. In Huxley and Martin's 'Biology' the other extreme is taken, and facts, only, presented; in the present work we believe that a much more thorough acquaintance with the actual structure of animal bodies is needed than is presented in the first part, before the student can avail himself of the more systematic morphological portion. The work is not complete in itself: it needs and will be supplemented by others; nevertheless it is one that no zoötomist or zoölogist can afford to be without.

A Course of Elementary Instruction in Practical Biology. By T. H. HUXLEY. Revised and edited by G. B. Howes and D. H. Scott. London and New York, Macmillan. 16°. $2.60.

HUXLEY and Martin's 'Practical Biology' has long since won an enviable place as a text-book in our best institutions, and the present edition contains many important improvements that will meet the approbation of teachers. In size, the present is nearly twice that of the former edition, and its arrangement has been materially changed. Especially do we approve of the principle, that has already been accepted by other authors in similar treatises, of starting the student in on work that is more familiar to him, and gradually leading him to less familiar fields, rather than the adherence to a more logical and systematic but less practical view of living structure. In the present edition the arrangement has been so changed that the student is first taken through a careful study of the frog, and then follows successively the study of the cray-fish, earth-worm, snail, mussel, polyps, animalcules, yeast, protococcus *Spirogyra*, bacteria, moulds, stoneworts, fern, and bean. Even with the present arrangement, we believe that the student's interest would be sharpened, and his skill increased, by a preliminary study of the best-known and most familiar of all structures, the human body. The portion devoted to the frog has been most largely increased; and the additions of the earth-worm, snail, and *Spirogyra* add to the value of the book. The appendix is a happy addition to the work, and is a good, fresh, and succinct account of microscopic material and technique.

The work is undoubtedly accurate: the authors' names are not needed as a guaranty of this. The omission of figures and plates is objectionable to some; but the true use of the work, that of a guide to the student in the examination of specimens for himself, neither requires nor desires such. It is too advanced for the general undergraduate student, but is excellent for post-graduate work in preparation for medical studies. Some day, though we fear it may be far in the future, such preliminary work as this will be required of all medical students: it would go far towards mitigating the very just opprobrium under which most medical colleges of our country now suffer, — that of being the most unscientific of all scientific schools. The work would be improved by a more comparative morphological treatment. But little is said of the general principles underlying structure, and the relations of the general types are not made apparent, as they should be.

A Popular Zoölogy. By J. DORMAN STEELE and J. W. P. JENKS. New York and Chicago, Barnes. 12°. $1.40.

First Lessons in Zoölogy. By A. S. PACKARD. 2d ed. New York, Holt. 12°. $1.

BOTH of the above text-books are by well-known authors, coming simultaneously from Brown University, and both are worthy of commendation; but both are not of like merit in all respects, nor adapted for the same class of pupils. Steele and Jenks's book is designed to interest and instruct; Packard's, to instruct and interest. The former is more elementary and popular; the latter, for a somewhat older grade of pupils, and is more scientific. The one deals with the familiar forms of life more fully, — there is an undue amount on birds, — and is rather too much after the style of Tenney; Packard's work is more philosophical, and treats of principles rather than of details.

If is very difficult in a text-book on zoölogy, especially one intended for young pupils, to hit the happy mean between meaningless details and a dry, uninteresting compendium of comparative anatomy. Furthermore, the value of an elementary zoölogy depends upon who the teacher is. If he is, as is too often the case, one who knows as much about the principles of zoölogy as he does of those of the Aztec language, then no book will be of much value; if he is a good zoölogist himself, he does not rely very exclusively upon any text-book. For the pupil who must depend largely upon himself, Steele and Jenks's book, with its numerous good illustrations and anecdotal style, can be recommended; but, for the more scientific yet interesting application of the principles of animal life and its classification by a qualified teacher, the excellency of Packard's work cannot be gainsaid. The additions in the present edition of the last work are confined to the *Insecta*, *Ctenophores*, and the horseshoe crab.

NOTES AND NEWS.

IN 1887 an association was formed in Ireland for the promotion of silk-culture in the south of the island. The hope was to utilize land now devoted to very unproductive crops. The Journal of the Society of Arts states that the river-valleys of Munster are especially suited for the growth of the mulberry-tree. The present effort to introduce silk-cultivation divides itself into two parts, — first the cultivation of the mulberry-tree, and next the rearing of cocoons. To accomplish these objects of the association it is proposed, and is actually being done on a small scale, to distribute mulberry-trees among those who last year reared such silk as to "equal any Italian or other silk." Count Dandalo, in his Italian work on the silkworm, says that Ireland, from many circumstances, appears peculiarly favorable to the cultivation of silk. The experiment of rearing silkworms is being tried by about thirty families, but large results are not expected at once, as the imported mulberry-trees will not leaf well in the first year. It is remarked, that, if the re-afforesting of Ireland be desirable, some of the trees should be the useful mulberry. Another part of the scheme is to introduce reeling-machines, which can be used by ladies in their own homes. Sericulture has been in every country rather an occupation for the family than for the factory, which gives it a special claim to attention, at a time when those whose circumstances forbid them from seeking employment outside their own homes are suffering keenly from the general depression.

— The Society of Science of Harlem has just published Volume I. of the works of the illustrious Huygens. This is a volume which will be of special value to the physicists and historians, and we can but commend this republication of the works of the pioneers in science. The Physical Society of France has done a similar piece of service in republishing the works of Coulomb and Ampère.